



Oak Ridge Institute for Science and Education (ORISE)

Report from the DOE Voluntary Protection Program Onsite Review, December 15-18, 2003



U.S. Department of Energy
Office of Environment, Safety and Health
Office of Corporate Performance Assessment
Office of Quality Assurance Programs
Washington, D.C. 20585

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Abbreviations and Acronyms

ANSI	American National Standards Institute
ATDD	Atmospheric Testing and Diffusion Division
BLS	Bureau of Labor Statistics
CAIRS	Computerized Accident/Incident Reporting System
CHP	Certified Health Physicist
CHMM's	Certified Hazardous Materials Managers
CIH	Certified Industrial Hygienist
CSP	Certified Safety Professional
DOE	U.S. Department of Energy
ECP	Employee Concerns Program
EMT	Emergency Medical Technician
EP	Emergency Preparedness
ES&H	Environmental, Safety and Health
GERT	General Employee Radiological Training
HWA	Hazardous Work Authorization
IPP	Individual Performance Plans
ISMS	Integrated Safety Management System
JHA	Job Hazard Analysis
JSA	Job Safety Analysis
MSD	Material Safety Data Sheets
NOAA	National Oceanic and Atmospheric Administration
NRRPT	National Registry of Radiation Protection Technologists
OAV	Operational Awareness Visit
ORAU	Oak Ridge Associated Universities
ORISE	Oak Ridge Institute for Science and Education
ORNL	Oak Ridge National Laboratory
ORPS	Occurrence Reporting Process System
OSHA	Occupational Safety and Health Administration
PE	Professional Engineer

PM	Preventive Maintenance
PPE	Personal Protective Equipment
PRWC	Physical Requirements and Working Conditions
REAC/TS	Radiation Emergency Assistance Center/Training Site
S&H	Safety and Health
SCATS	Safety Corrective Action Tracking System
VPP	Voluntary Protection Program

Executive Summary

The Department of Energy-Voluntary Protection Program (DOE-VPP) onsite review of the Oak Ridge Institute for Science and Education (ORISE) was conducted from December 15-18, 2003, in Oak Ridge, TN. Oak Ridge Associated Universities (ORAU) is the operating contractor for the Department of Energy (DOE). The following summarizes the review team's observations and analysis.

Management Leadership

The DOE-VPP Onsite Review Team (Team) found high degree management commitment of safety and health (S&H) at ORAU/ORISE. Responsibilities and accountabilities are well defined and implemented by the management. The President of ORAU/Director of ORISE and other managers of ORISE actively participate in safety programs and have successfully established a relationship of mutual respect and cooperation with workers on all matters relating to safety program implementation. ORISE management believes that all accidents are preventable and established goals to achieve "zero injury". VPP is considered as taking the Integrated Safety Management System (ISMS) to the next level with a view that they complement each other. Program evaluation is strong and there is open communication between management and workers. Contractor management is excellent. The Team noted that management held themselves responsible and accountable for S&H in the workplace. Top-level management is visible at work place and actively participates in the development and implementation of S&H programs.

Employee Involvement

The Team found that employees strongly expressed their commitment to safety at ORISE. Employees work together with management to implement safety programs at ORISE. The employee involvement not only occurs through their participation in the safety council meetings and training activities, but also through safety inspection processes. Employees openly stated that they not only felt responsible for their own safety, but also for their peers' safety. The Team observed that employees are truly involved in the S&H program and a strong safety culture has developed at this site. Notably, employees are not only involved in hazard recognition, job hazard analyses, but also in hazard resolution. Information from Safety Council and Site Safety Representative meetings is effectively disseminated to other employees.

Worksite Analysis

Members of ORISE work groups participate in preuse/prestart-up assessments and inspections. A comprehensive baseline hazards analysis has been completed by S&H

professionals for all facilities. Self-inspections are conducted monthly - the entire “site” is inspected at least once each quarter; personnel who conduct inspections are trained. Job hazard analyses (JHA) are well developed, communicated and used; employees are involved. Employees are encouraged to communicate any unsafe conditions or issues; both oral and written methods are well developed (including an “anonymous” reporting option and “feedback” component); the methods are used by employees throughout the organization. Identified hazards are addressed – with the condition/issue documented, a responder/actionee assigned, and appropriate corrective actions taken in a timely manner; actions are tracked to completion. Accident investigation and lessons learned processes are developed and implemented. The site has established trending of injury and non-injury safety & health data; results are used for continuous improvement action development; results are communicated to employees. All sub-elements of this VPP tenet have been in place for at least three (3) years.

Hazard Prevention and Control

ORISE has a well-qualified group of safety and health professionals including Certified Safety Professionals (CSP), Certified Industrial Hygienists (CIH’s), Certified Hazardous Materials Managers (CHMM’s), Certified Health Physicists (CHP’s), and radiological technicians with certification through the national Registry of Radiation Protection, and Occupational Physicians (MD’s). The Safety and Health Rules, work practices, and usage of Personal Protective Equipment (PPE) were found to meet the requirements of VPP. Preventive maintenance programs were developed with involvement of workers and are effectively used to mitigate the chances of unplanned equipment failure, thereby enhancing safe operations at ORISE. The site has a strong emergency preparedness program and the radiological program complies with 10 CFR 835 requirements. ORISE has an excellent medical program and physicians from the Radiation Emergency Assistance Center/Training Site (REAC/TS) are available to support the ORISE medical program.

Safety and Health Training

Employees are trained and certified appropriate to their job descriptions and responsibilities; employees at all levels knew how to identify and protect themselves and others from hazards associated with their jobs. Training required and completed is documented. Through staff and safety meetings, supervisors reinforce training – including emergency preparedness – throughout the year. Employees stated in interviews that the training provided has made them more conscious of health and safety issues not only in their work environment, but also in their everyday lives away from the site. Managers and supervisors routinely receive special S&H training commensurate with their responsibilities. Safety meetings are held regularly. All elements of this VPP tenet have been in place for at least three (3) years.

Conclusion

The Team concludes that ORAU/ORISE has satisfied the requirements for participation in DOE VPP and recommends that DOE approve STAR status to ORISE.

I. Introduction

The DOE-VPP onsite review of the ORISE was conducted during December 15-18, 2003, in Oak Ridge, TN. The operating contractor for DOE is ORAU. ORAU is a non-profit research and training organization sponsored by approximately 88 PhD granting Universities in the United States. ORISE has 450 full-time employees working at ORISE and 150 Post-Doctoral employees working at the Oak Ridge National Laboratory (ORNL). Additionally ORAU appoints 178 research participants to full-time positions at national laboratories across the country. These individuals do not work at ORISE. In CY 2002, subcontractors accounted for only 0.5 percent of total work time logged. No labor unions are involved at ORISE. The Department of Energy's Oak Ridge Operations Office provides guidance to ORAU/ORISE on a regular basis and has oversight responsibility.

The ORISE site includes seven buildings: ORAU campus, Vance Road, REAC/TS, Laboratory Rd, Warehouse Rd, Atmospheric Testing and Diffusion Division (ATDD), and Scarboro Rd. Some of these buildings are historic and old. A new building is under construction at Oak Ridge with plans to consolidate office space for ORISE employees. However, no change in mission or work is expected to take place in the future.

The VPP application submitted by ORAU encompasses all work conducted by ORISE regardless of the sponsoring and supporting organization at the site. Availability of electronic references in the application provided an abundance of records and information. The electronic links within the application provided easy access to information. ORISE was the first organization in the DOE complex to beta test the eVPP, an electronic system newly developed by DOE Headquarters.

The Team evaluated the safety programs of ORISE against the requirements of the DOE-VPP. The DOE-VPP onsite review team (Team) consisted of safety professionals from DOE Headquarters, DOE -Oak Ridge Operations Office, and DOE-Richland Operations Office. (See Appendix for a roster of the Team and the areas of assigned responsibilities of the team members). During the site visit the Team evaluated relevant safety documents and conducted interviews to evaluate and verify the information submitted by the ORISE VPP application.

II. Injury and Illness Data Assessment

A review of the Occupational Safety and Health Administration (OSHA) 200/300 logs was made. The rates below include subcontractor and instructor hours and injuries:

INJURY AND ILLNESS DATA FOR ORISE					
Calendar Year	Lost Workday Cases	Total Recordable Cases	Employee Hours	Lost Workday Case Incident Rate	Total Recordable Case Incident Rate
2000	4	12	1,280,698	0.62	1.87
2001	3	12	1,251,615	0.48	1.92
2002	0	2	1,260,105	0.00	0.32
3-Year Average	7	26	3,792,418	0.37	1.37
Bureau of Labor Statistics (BLS) average for SIC 873 Research development and testing services 2001				0.9	2.3
ORISE percent below BLS rate				41%	59%

The information on the OSHA 200/300 logs supports the data provided in the application, the organization's first report of injury forms and other recordkeeping documents. A health and safety professional is responsible for classifying all injuries and illnesses for OSHA recordability and is responsible for maintaining the OSHA log. Injury/illness data is submitted for inclusion in the DOE HQ Computerized Accident/Incident Reporting System (CAIRS). Routinely the data output from CAIRS is checked against the actual data reported and submitted. This ensures that accurate information is being presented in the CAIRS database. The staff understands the recordkeeping requirements including the 29 CFR 1904 recordkeeping changes that went into effect in January 2002. The information on the OSHA 200300 logs support the information provided in the application and the organization's first report of injury forms supports the data in the logs.

The organization requires all subcontractors to maintain logs and report injuries/illnesses for inclusion into CAIRS. Trending and analysis is conducted by ORISE staff with the assistance of specialized data bases. During 2000-2003, ORISE submitted nine occurrence reports to DOE's Occurrence Reporting Process System (ORPS), and none of them were significant.

III. Management Leadership

The level of management commitment found at this site meets DOE-VPP criteria. The sub-elements of this tenet and an evaluation of the applicant's performance in these areas are addressed and described below.

A. VPP Commitment

Management support and commitment are critical to the successful implementation of the DOE-VPP. ORISE management has implemented a number of well-integrated safety management systems drawing on the guidance and support of its parent, ORAU. These systems work together to ensure that all work is managed, and all recognized potentially hazardous situations are identified and mitigated. This level of commitment is reflected in continuous immediate accessibility of all managers to the principle work areas of the site. The employees, almost without exception, indicated that they were able to communicate both formally and informally with all of their managers at any time for any safety issue and gain immediate action for their concerns. Likewise, most safety issues are resolved at the lowest working level as they arise with an understood full management endorsement.

ORISE policy states that: "ORAU will comply with all DOE requirements and guidelines for implementing ISMS." ORAU adopts the ISM premise that accidents can be prevented through strict attention to work design, hazard identification and control, appropriate safety standards, worker involvement, and management commitment. ORAU fosters free and open expression of safety concerns without fear of reprisal, maintains safe and productive working environment, and hold employees at all levels accountable for safety. During the interviews conducted by the Team, employees indicated they were aware of this position. In August 2002, DOE Oak Ridge Operations Office validated the ORISE health and safety program including ISM. ORAU continues to benchmark the VPP certification process and considers it as "taking our ISM program to the next level," with a view that these programs complement each other.

The ORISE managers are involved at every level and show their commitment to worker safety by helping to identify the worksite hazards and reduce the risk of injury and illness to employees. The ORISE Policy and Procedures, ESH-IPD-100, identified DOE VPP as the benchmark of health and safety program success and has effectively implemented the policies and procedures to achieve such goals. The mission and vision of ORISE were clearly stated for creating a safe environment for worker safety.

Management's involvement, participation, and visibility in safety are evidenced by their endorsement of managers and worker's participation in workplace safety activities. These activities include participation in the Safety Council and other safety committees.

All employees and management have performance criteria that include safety performance as a key element of their yearly Individual Performance Plans (IPP). Any employee at ORISE can report a safety related concern or issue without fear of reprisal or harassment.

B. Leadership

The ORISE President, and managers at ORISE solidly demonstrate management commitment. ORISE's commitment is demonstrated in strong safety and health policy statements, allocation of resources necessary to support all safety and health program activities, attention to employee identified safety and health concerns, active participation in safety promotional activities, and leadership/mentoring for employee safety team activities.

ORISE has established a hierarchy of committees and teams that appear to effectively provide an opportunity for all employees to be involved in the safety program. Starting with the VPP coordinating committee, and working down through several process and discipline specific committees, workers and managers cooperate to plan and administer the safety process.

C. Organization

ORISE is organized to support its roles, responsibilities, and policies. The President of ORAU acts in a dual capacity as the Director of ORISE and is assisted by a Deputy Institute Director and by seven division Directors. Through review and observation of the processes in action, the review Team is assured that safety is integrated into ORISE organizational design. They are organized into seven major divisions: Basic and Applied Research, Radiological Safety, Assessment, Training, National Security Operations, Emergency Management, Science and Engineering Education and Performance Systems. In addition six support units such as Human Resources, ES&H, Business Operations etc, provide expert assistance. The Director of ES&H reports directly to the ORISE Director, serving the entire organization. The ES&H Office utilizes the expertise in ORAU and draws professionals from other divisions as needed.

D. Responsibility

The President of ORAU who acts as Director of ORISE has overall operational responsibility as a Chief Executive Officer for ensuring ORISE employees comply with safety policies and programs. Top management at ORAU/ORISE is prominently involved in all elements of the ES&H program, and they are committed to the implementation of a well-coordinated ES&H program, including establishing a clear line of communication with employees. ORISE subscribes to the philosophy that line management is responsible for safety. However, it is clear that management needs help

with implementing the ES&H Program, that each employee takes personal responsibility and ownership for safety and has a significant role to play in implementing this program.

ORISE has clearly defined the roles, responsibilities, accountabilities, and authorities for conducting business. Managers and employees have been clearly made responsible for safety at all of the ORISE facilities located in Oak Ridge. Policy acknowledges that at ORISE there is a team of ES&H specialists with technical expertise, including a variety of disciplines such as industrial hygiene, fire protection, and radiation protection that are available to achieve excellent performance. For that reason, highly qualified ES&H professionals can be part of the operating teams that ensure that work is performed safely, and these other site-based ES&H professionals provide an independent overview of ORISE.

E. Accountability

Management is committed to providing the leadership, direction, goals, training, resources, and standards to assist employees in the performance of their duties in a safe and healthful manner. Management and employees share the responsibilities to carry out individual duties in a safe manner. Managers are held accountable for safety by specific standards within their individual performance standards and also accountable for the consistent enforcement of company safety policy. There is a formal written performance appraisal system with safety and health responsibilities as a critical element for management.

The annual performance reviews are a key method used by the site to hold all employees, including managers and supervisors, accountable for their performance. The annual performance reviews, which are conducted for all employees, consider safety and health performance as a major element of the review. Employees have input to what their specific safety and health expectations are for the rating period. Additionally, the results of these reviews directly affect annual merit pay considerations. Management has an established policy allowing disciplinary action(s) for violations of rules, policy and requirements, thereby ensuring accountability on the job. Accountability is regularly communicated to all employees through staff meetings, safety meetings, training, site publications and annual performance reviews. All subcontractors are expected to follow these safety and health requirements, and they are held accountable for meeting these requirements, both through formal contractual agreements and through the implementation of formal policies, procedures, and directions. Failure to comply with these requirements and/or continued non-compliance can result in dismissal from the work site.

F. Authority and Resources

All ORISE employees are empowered by management with the authority to address and to correct safety concerns. This review indicated that the system utilized is effectively

working. The Director has the ultimate responsibility with the assistance of full-time professional, technical and administrative employees, and the various safety teams. Adequate resources, including staff, equipment, materials, training and professional expertise have been committed to workplace safety and health.

ORISE changed their management system in 2001 to a safety & health related Integrated Safety Management System (ISMS). This in-turn, changed many aspects of safety and health projects, investments, training, and funding processes. This system of standards based management places emphasis on safety and health, work site analysis, hazard identification and prevention/control, and management and staff related assessments.

The ability to invoke the use of “stop work authority” has been clearly communicated to the entire staff, along with the understanding that any perceived repercussions would not be tolerated. Likewise top management maintains an “Open Door” policy that rarely is used because managers are typically both very available and highly responsive to individual employee safety issues/concerns.

Corrective actions on safety findings, issues, and other items, while typically very few, are corrected quickly and tracked until completion. This included two VPP team review items. The previous budgets have been adequate, as budgets are not specifically identified for safety. Funds are allocated as needed from a common budget. Hence, there is no sense of competition for safety funding.

G. Planning

The need to build S&H into projects is well-ingrained within the ORISE safety culture and policy. The annual planning process requires managers to analyze and plan for employee training, ES&H, and operational costs for doing business. An institutional safety plan helps capture long-term goals and capital expenditures. An integrated planning framework has been established to provide a comprehensive template to ensure the planning process is comprehensive. The work process at ORISE integrates S&H into the work life cycle.

The inclusion of safety and health planning by management begins at the operating level. At higher levels, managers are required to plan and outline safety and health support as part of their scope of work. Overall, the Team found that the safety and health program is goal driven with annual review and modification of goals and objectives based on actual performance. Safety and health planning is extremely thorough and it is designed to ensure continuous improvement.

H. Contract Workers

The Procurement Office of ORISE conducts thorough investigation of the contractor’s safety record prior to hiring them. A “Performance-based” approach, including a 10%

reduction if necessary to penalize for any unsafe work, is built into the conditions of ORISE contracts. Contract workers are expected to meet the same standards for safety as ORISE staff. Contractors or their workers who do not meet those standards may be barred from performing work at ORISE. No recent examples could be found, however. As was already indicated in the Introduction section of this report, contractor or sub contractor work at ORISE is very minimal (accounts for 0.5 % of total ORISE work hours).

ORISE staff oversees its contractors at every stage. Failure to comply with safety and health rules, regulations, and policy can result in dismissal from the site. Subcontractors who repeatedly violate the same rules, policies or standards may be dismissed from the site and prohibited from future work.

All subcontracted work employees must receive the primary site orientation through General Employee Training (GET); activity and workplace specific orientation.

I. Program Evaluation

Annual program evaluations have been conducted using VPP criteria since 2001. Evaluations of the S&H program are conducted with participation by both management and employees. Self-assessments and annual reviews are used as a means for continuous improvement in the S&H program.

The results of annual program evaluations and other S&H trending data are used by ORISE to develop goals and objectives for the coming year. Employees conduct the annual evaluations and the results are formally documented. Every corrective action is then tracked to completion using the computer software Safety Corrective Action Tracking System (SCATS). Yearly goals and objectives for the S&H program and the individual units are developed and partially based on the results/findings of the annual program evaluations.

The last annual VPP program review was completed in April 2003. The report provided self-assessment of both ISMS and VPP with cross-references, identifying the areas needing improvement, and included detailed corrective actions and goals to ensure the VPP effort and overall program is continuously improved at this site. The Team suggested that all sub-elements of the VPP tenets should be fully described in future reports. However, the approach used to combine ISMS and VPP is useful since both safety programs are complementary.

J. Site Orientation

All new employees, Post-Doctoral participants and visitors are required to complete an initial orientation program conducted by the Human Resources of ORISE. This orientation program and other site orientation training offered by ORISE covers several

topics such as ISM tools, DOE Order 440.1, security rules and regulations, etc. Additional training to orient new workers to ORISE include laboratory safety, chemical safety, and radioactive material safety. The custodial staff is also required to complete training within two weeks of employment. These courses include topics such as asbestos awareness, and General Employee Radiological Training (GERT).

K. Employee Notification

The employee notification program surpasses the requirements for employee notifications contained in DOE Orders and guidance documents, and these requirements exceed the OSHA (Federal and State) requirements for employee notification. ORISE adopts a number of communication mechanisms designed to appeal to the diverse population.

The President of ORAU and other managers have clearly accepted responsibility for the safety of their employees and the operations under their control by establishing ES&H policies. The management of ORISE is fully committed to achieving a safe and accident-free work environment.

L. Management Visibility

Top-level management is clearly visible and actively participates in the S&H program. ORISE management regularly participates in various S&H activities. Managers are held accountable for their S&H responsibilities and maintain a policy of accessibility with regard to S&H issues that arise in the workplace. An “open door” policy ensures that any employee at any time can express a safety concern to any level of management. The team confirmed this policy through formal and informal interviews, and noted that most employees did not feel the need to raise concerns above their first-tier or immediate supervisor because concerns were resolved almost immediately. The Team encourages and applauds the efforts of ORISE management to continue its plans to provide additional oversight to Post-Doctoral employees at ORNL and to the 10 or 15 ORISE employees at the ATDD/National Oceanic and Atmospheric Administration (NOAA) building.

M. Conclusion

The Team found very strong management commitment to safety at ORISE and evidence of active involvement of management to achieve the goals specified. ORISE meets all the requirements of the Management Leadership tenet and its sub-elements as described above.

IV. Employee Involvement

The onsite review clearly indicated that employees are actively engaged in the S&H program. In addition, review of program documents and the results of interviews showed that management has empowered employees to proactively administer the S&H program at this site. Partnership between management and employees to provide a safe workplace is evident at all levels. The degree of employee involvement in safety and health found during the review clearly meets all DOE-VPP criteria for employee involvement.

A. Degree and Manner of Involvement

The information gathered for this portion of the report relies heavily on observations of employees in the workplace while conducting their routine duties, and on both formal and informal interviews of employees. Employees feel they own the safety culture. Employees at all levels feel comfortable to raise concerns and participate in their resolution. Employees throughout the site feel no barriers to communication with management when it comes to safety and health.

Workers were candid and showed no fear in talking with the VPP review Team during interviews. All employees indicated that they understood their rights and responsibilities, and are very knowledgeable about their responsibilities regarding safety and health. Interviews confirmed that a strong safety culture exists at all levels, and employees feel empowered to voice safety concerns. All employees interviewed (formally and informally) strongly expressed their readiness to stop work if they felt conditions were unsafe and their belief that management would support the action.

Most employees were familiar with ORISE's efforts to continually improve safety programs. They understood that the pursuit of VPP recognition was part of ORISE's efforts to sustain ISMS principles by taking it to the next level. Employees expressed their opinion that this was good business practice and supported the pursuit of VPP. All employees interviewed were very knowledgeable regarding their rights to request reports of inspections; accident investigation; and injury and illness records. All stated that they were given timely and complete written and/or oral feedback to safety and health questions and issues. During interviews, employees were positive about the information disseminated regarding off-the-job safety. Taking safety home seemed to be an important aspect of the employees overall safety attitude. Communication tools employees mentioned during interviews were: Just Ask, Outlook, Shortcuts, and the Newsline.

Overall, it was clear that the work force has enthusiastically welcomed the opportunity for increased participation in all aspects of the organization. When asked how the VPP process has impacted their work, most employees interviewed responded that their

awareness level has increased; they are analyzing the effectiveness of their present safety systems and recognize how their work may impact the safety of others. Employees indicated that the Company's VPP efforts have kept safety in the forefront. Many workers indicated that the VPP effort has moved the ORISE safety programs to a higher level. Some comments made during the interviews were:

"Management emphasis on safety helps keep me more aware."

"Safety is just good business practice."

"With VPP the company is saying we value you as an employee, your opinion and your input."

"ISM has made people more aware. It's to everybody's advantage to work safe."

"Safety has gotten better over the last 20 years, but it's always been a safe place."

"Safety is No. 1 now. It's always been important, but it's big now."

B. Safety and Health Committees

Employees are knowledgeable about the VPP effort at this site through several committees including:

- **ORAU Safety Council** – This committee is chaired by the ORAU President/ORISE Director and consists of all program, department and other group directors, their Site Safety Representatives (SSRs).
- **Site Safety Representatives Committee** – Consists of 22 primary and 22 alternate SSRs with the ES&H Director acting as chairperson.
- **VPP Team** – Team has representation from program and support services management, SSRs, and ES&H professionals.
- **Natural Work Teams** – These teams meet for process improvement in work routines and are formed of employees in work units having similar functions.
- **ORAU/ORISE Health Physics Lunchtime Group** – All health physics staff meet to discuss current issues and share information.
- **ALARA Committee** – Representation from radiation protection programs throughout ORAU/ORISE meet to promote ALARA principles, review health physics concerns, and provide technical support.

C. Notable Programs/Processes

Natural Work Teams

Employees within a given work group form Natural Work Teams for the purpose of process improvement. Meeting schedules are variable and the minutes are informally recorded but are shared with all of the unit managers. Meetings are frequently used to integrate health and safety processes in the work routines. This is an excellent example

of how employees are empowered to improve safety and health in their day-to-day work as well as improve work processes. The employees involved in the Teams are knowledgeable about the work, the processes, and the desirable outcomes.

Job Hazard Analysis (JHA)

All work performed by employees has been analyzed and control measures defined using one of the hazard analysis methods (JHA, ISM plan, or Health and Safety Plan). JHAs have been developed to include travel, general office, laboratory, maintenance work, emergency response, and office equipment. In interviews with employees and management it was evident that employees feel they “own” the JHA process. For example, in one division a new paper shredder was purchased that was larger and more complex than the previous unit. As the machine was being installed the employees wanted a JHA. The manager asked for volunteers and the employees formed a team to develop the job hazard analysis. One-half of the team prepared the JHA and the other half reviewed the product to ensure that all issues/concerns had been addressed. The completed JHA was given to the manager for review and approval.

Just Ask Program

The Just Ask program was initiated in the late 90’s as the result of a major reorganization. It was initially designed to address issues employees may have regarding the reorganization. The program has grown to be added as a link on Safety First so employees may ask any question, make a comment or suggestion relating to safety and health. Questions and corresponding answers were reviewed as part of this assessment. It is apparent that employees feel free to suggest improvements or comment on issues. Responses are timely and tracked to closure. Feedback surveys are conducted and the most recent survey (2003) showed that 83% of the employees responding wanted to keep the program. Many employees responded that it was a good information source which helped clear things up and was a good opportunity to ask questions without fear of embarrassment. During interviews with employees this program was discussed and many indicated they liked it because even though they thought their question might be considered dumb from some employees they felt free to use the program with the anonymous feature. All employees can access the questions and see the corresponding answer. All employees interviewed strongly expressed the opinion that this was an excellent tool.

D. Conclusion

Employee ownership has taken root in many forms throughout this worksite, and it appears that it can be sustained by the infrastructure put in place by management and desire of the employees to make safety their first priority. Employees are proud of their worksite and feel safety is integral to maintaining a world-class training organization. ORISE meets all requirements for the employee involvement tenet.

V. Worksite Analysis

The worksite analysis processes across ORISE are structured and implemented according to ISM core functions and guiding principles; these processes adequately identify hazards to the workers, the environment, and the public; the processes specify control measures according to the “hierarchy of controls.” Formal worksite analysis processes for control of operations and the mitigation of hazards or potential hazards are in place. Personnel interviewed during this review and observations made by the Team confirmed that these processes are used and understood by ORISE employees throughout the organization. The onsite review clearly showed that ORISE has the processes effectively developed, communicated, implemented, and self-assessed to meet not only the tenet of worksite analysis, but also each of the seven (7) elements of worksite analysis. These processes have been in place for at least three (3) years. Description of the processes and activities at ORISE for worksite analysis are presented below.

A. Pre-use/Pre-startup Analysis

New or modified facility designs, operations and processes at ORISE are reviewed and analyzed to identify and mitigate potential hazards before work is started. S&H professionals review/approve requisitions for equipment and material to identify potential hazards before they are purchased. Proposed laboratory experiments undergo a hazard analysis before being conducted; a procedure or JHA is prepared. ISM provides detailed comprehensive ES&H requirements for planning, analysis and control of hazards

Purchases of goods and services that require a contract are executed in accordance with the ISM subject area, Purchasing Goods and Services. S&H issues are identified and addressed through purchasing constraints and contract provisions. Appropriate contract provisions are assured through the involvement of trained specialists.

New and modified equipment must meet ORISE requirements for safety (e.g., guarding, electrical safety, noise levels, etc.). Consensus and regulatory standards (such as the American National Standards Institute (ANSI), National Electrical Code, etc.) are specified where appropriate. Complex or safety-significant systems require a level of readiness review and/or acceptance testing specified by the ISM Plan. Before beginning the work, operations manager and operations team members ensure that the risks and hazards are controlled (with permits, procedures, training, etc.) as specified in the ISM plan and JHA. ISM provides guidance regarding the criteria that various types of equipment must meet, thresholds where overview or additional approval is required, and processes to be followed to ensure that procured equipment is properly analyzed and hazards adequately mitigated.

Interviews demonstrated that affected employees and S&H professionals are routinely involved in this process. For example, one employee stated in an interview that her work group helped design the new Beryllium Lab facility, so that the compressed gas cylinders were placed behind a shielded wall – access for cylinder change is easier and contamination is prevented.

B. Comprehensive Surveys

A comprehensive baseline hazard survey has been completed. The survey (Hazards Survey) provides the basis for a number of ISM and DOE-prescribed activities; specifically, the survey is used for emergency preparedness, development of industrial hygiene monitoring plans, assessment of physical requirements and working conditions (PRWC), and exposure assessments, and others. The survey provides both a narrative description and a checklist/matrix; the survey identifies physical and environmental hazards. Chemical hazards are identified in a general sense in the Hazards Survey, but are delineated in a separate document (a precaution specified by security). Combining these documents (if possible), as well as modifying the survey checklist/matrix to identify the more serious hazards in unique locations/operations, would seem to make the Hazards Survey a more useful tool.

Monitoring of personnel for chemical and physical hazards, performed by trained industrial hygienists under the direction of a CIH, is conducted in accordance with nationally recognized procedures and protocols. Biologic hazards are identified and assessed.

The method used for exposure assessment is quantitative – and thus provides an immediate profiling and prioritized approach to sampling and specifying additional control measures. A significant accomplishment is the (approximately) 20-fold reduction in the use of perchloric acid in one of the labs. The alternative process allowing for this reduction was developed by one of the ORISE employees.

An environmental/IH professional routinely performs assessments of work areas to validate the Hazards Survey and Exposure Assessments, as well as assisting with environmental/hazardous waste issues and chemical inventories.

C. Self-Inspections

Site Safety Representatives (SSRs) conduct monthly inspections; manager/supervisors join the SSR on inspections on a rotating basis. This process is an excellent example of employee involvement and line management participation. Inspections are conducted so that the entire “site” is inspected at least once each quarter.

SSRs are trained to conduct inspections; while all have received training by S&H professionals in an informal setting, several have completed the OSHA 10 hour course

for “general industry.” ORISE has indicated that they intend to have all SSRs and manager/supervisors trained using this course in the near future, and will formalize this requirement in the applicable procedure, based on their own self-assessment results and comments from the Team.

Representatives from the DOE-Oak Ridge Operations Office join ORISE employees in monthly operational awareness visits (OAV). It was evident from interviews with both DOE and ORISE employees that these visits have provided an exceptional level of collaboration and appreciation for one another’s expectations toward the S&H goal of “zero accidents,” and, more importantly to ORISE employees have been the catalyst for engendering a collegial approach to problem solving and decision-making on S&H issues involving both entities.

Inspections are documented on forms developed by ES&H, or by employees and manager/supervisors from the individual department/division (and reviewed by ES&H). Non-compliances and issues are documented – and actions tracked to completion – on the ORISE SCATS. The inspection process is well defined in ISM Plans. Results from the assessment are analyzed to produce information useful to improve performance and prevent recurrence of negative issues.

It was immediately apparent that the inspection process is fully implemented and effective, as evidenced by the cleanliness and the lack of non-compliances and S&H issues found by the Team during walkthroughs of the ORISE-controlled work areas. So much so, that in areas not under the control of ORISE, but co-occupied by ORISE personnel (e.g. NOAA facilities) – while still in pretty good order – stood out as not meeting the level of ORISE expectations. ORISE representatives are aware of this issue and have already taken steps to help improve the situation. The occasional non-compliant conditions found (none in ORISE-controlled facilities) were handled immediately by ORISE.

D. Routine Hazard Analyses

All work performed by ORISE employees – including training, travel, general office, laboratory, hazardous waste site operations/support, construction (performed by subcontractors), maintenance work, emergency response to radiological events, etc. – has been analyzed and control measures defined using one of the hazard analysis methods; Job Hazard Analysis (JHA), ISM Plan, or Health and Safety Plan. This process is fully described in the ORISE ISM Policy and Description documents.

When routine tasks are performed, provided the safety conditions have not changed since the JHA was last reviewed/approved, the JHA can replace the need to complete another hazard evaluation. This allows routine activities, such as routine maintenance, to proceed without additional hazard analysis. However, for those activities involving activities not previously analyzed, activities involving changed/changing conditions, or “hazardous” activities a Hazardous Work Authorization (HWA) is required (in this regard, “hazardous

activities” are defined as including confined space entry, “hot” [electrical] work, welding/cutting, radiation work, work involving lead/asbestos, etc.). The HWA was developed in collaboration with employees in the maintenance department to provide a single permit system. Of particular note is the electronic routing/status/signature/forwarding nature of the process – which was developed by an employee in the ES&H department; this element of the process is a true time-saver, of potentially great value throughout the DOE complex!

It was noted that pre-job briefings are held for new and revised JHAs – as well as many routinely performed activities that involve a high level of risk (e.g. hands-on training using actual [though well controlled!] radiological sources). ISM Plans are reviewed annually - JHAs are reviewed when covered conditions/activities change.

The entire process is strongly integrated with the other aspects of the program. Of particular note is the near-100% level of *office personnel* who, during interviews, stated they had reviewed a JHA or ISM Plan covering some aspect of their work in the past year - providing clear evidence of how the routine hazards analysis program at ORISE is used in training employees to do their jobs safely.

E. Employee Reporting of Hazards

Employees are encouraged and expected to identify and report – without fear of reprisal - conditions that compromise or are not in compliance with company S&H programs. This statement, communicated to the Team by Dr. Townsend during the in-briefing, was strongly evident during interviews of employees and manager/supervisors; most employees stated they would have no problem directing a concern or comment to Dr. Townsend in person or via one of the optional written methods.

Three basic methods for communicating hazards and concerns are fully developed and implemented throughout ORISE:

- Verbal reporting to the immediate supervisor, SSR, or ES&H representative
- Just Ask (an electronic e-mail system, used for asking any question, about any subject)
- Safety 1st (an electronic e-mail system, used for asking about or reporting a safety-related issue [if a safety-related issue is received by Just Ask, it is transmitted to the Safety 1st coordinator])
- Formal Employee Concerns Program

Just Ask and Safety 1st (as well as the Employee Concerns Program) have an “anonymous” option. Just Ask, Safety 1st and Employee Concerns Program have built-in, mandatory feedback loops – a noteworthy practice!

Employees stated they felt that any of these systems can be used to report an “imminent danger” situation (though they unanimously said they’d use the verbal method to their immediate supervisor/manager); no one at ORISE could recall an imminent danger situation. Of additional significance, is that no ORISE employee expressed a personal fear of reprisal if they reported a safety concern; nor did any ORISE employee relate an instance where they had heard of/knew of such a situation.

Issues and concerns from Just Ask and Safety 1st are documented; an actionee/feedback provider is assigned to each item received; actions are tracked to completion, feedback is routinely provided; the entire process is placed on the ORISE intranet (easily accessible to all ORISE employees). Data received is trended and analyzed regularly.

Both systems were tested in a number of different ways by the Team; both systems passed these tests with 100%. Examples of safety issues and concerns – of various types, from all areas of the ORISE organization – were reviewed by the Team. Additionally, interviews with employees strongly supported the Team’s conclusion that these methods for “employee reporting of hazards” were developed, communicated, implemented, and used at an exceptionally high level.

F. Accident Investigations

ORISE has a system, documented in their ISM Plan and ES&H procedure, to investigate injury and near-miss events, including first-aid type injuries, and occurrences.

ES&H representatives are responsible for formal accident investigations (reportable events) – managers are responsible for investigating non-reportable events (they can, and often do, request assistance from ES&H). ES&H staff members conduct the investigations of significant events and ensure that root causes are properly evaluated and addressed; the Occurrence Reporting process uses a rigorous root-cause analysis on a graded approach as part of the investigation process.

Accident investigation is a module in the Leadership Training program, required for ORISE supervisors, managers, and directors.

Employees participate either as part of the initial investigation and/or as a member of the safety team conducting follow-up evaluation(s). Manager/Directors present the results of reportable accident investigations in the next ORISE Safety Council meeting (these meetings are chaired by Dr. Townsend, President of ORAU).

Examples were reviewed by the Team. Root causes are identified for events that are reportable to DOE (including recordable injury/illness events).

(While few, ORISE also investigates non-injury incidents – but does not have the requirement to do so. ORISE recognizes the need to add this requirement, and has plans to do so.)

ORISE has a formal lessons learned program, communicated through the ORISE intranet and other means.

G. Trend Analysis

Safety and Health performance and trending data are available to both management and employees, and it is used as the basis to modify, change, or establish safety processes. The data is also used to establish the overall company and organization safety objectives. The ES&H staff prepares and distributes data covering occupational safety, industrial hygiene, radiological control, environment, deficiency and corrective actions, and Just Ask/Safety 1st programs. Reports are available on the ORISE intranet; employees confirmed during interviews that they were aware of, and frequently reviewed the data/reports/analyses.

Inspection results are analyzed and trended by SSRs and the Safety Council, and distributed to employees (by a variety of means).

VI. Hazard Prevention and Control

The level and complexity of the hazard prevention and control program found at this site meets DOE-VPP criteria. Sub-elements of this tenet are addressed and described below.

A. Professional Expertise

ORISE has a well qualified group of safety and health professionals including a Certified Safety Professionals (CSP), Certified Industrial Hygienists (CIHs), Certified Hazardous Materials Managers (CHMMs), Certified Health Physicists (CHPs), radiological technicians with certification through the National Registry of Radiation Protection Technologists, a Registered Occupational Health Nurse (RN), and Occupational Health Physicians (MDs), all of whom are available to support ORAU management and staff members. Other staff members with safety and health related expertise on the ORISE programmatic side include staff of the Radiation Emergency Assistance Center/Training Site, the Radiological Safety, Assessment, and Training Department, and the Center for Epidemiological Research Beryllium Testing Laboratory. The site has ready access to these certified professionals for support of operations as needed. These professionals are used in direct support staff positions at ORISE. They are involved, along with employees, throughout the life of projects to provide consultation services, and review and approve permits and ISM plans.

B. Safety & Health Rules

ORISE has strong safety and health rules in the hierarchy of policies, procedures, and ISM plans. Hazards at this site are controlled using engineering controls, PPE, JHAs, work permits, and checklists. Site safety rules, work practices, and usage of PPE were found to meet requirements. The Safety 1st website delivers a comprehensive set of requirements and processes that provide staff with the standards, procedures, and guidelines they need to work safely.

Hazardous materials are reviewed by the ES&H organization before procurement. Hard copies of Material Safety Data Sheets (MSDSs) are maintained in the appropriate areas.

ORISE employees use safety and health rules to anticipate work hazards, to reduce hazards and potential exposures, and provide precautionary protection to workers in potentially hazardous situations/conditions. All hazardous work that may require permits (e.g., confined spaces, overhead work, and soil penetrations) is screened for the existence of potential hazards prior to beginning work.

Subcontractors must prepare health and safety plans prior to beginning work. Subcontractor work is monitored by ORISE employees to verify that it is performed as planned and in accordance with requirements.

Safety and health rules are used to guide and enforce/reward conformance to policies and requirements. A hierarchy of positive reinforcement is available and used by management to reward proper and exceptional behavior. Mechanisms for disciplinary action are also available.

Overall, the Team found that safety and health rules are followed by all employees, including subcontractor employees. Interviews with employees indicated they know and understand the disciplinary process should these rules not be adhered to. Those interviewed felt this process was both fair and consistent, and gave examples of positive reinforcement received from supervisors and management for good work practices.

C. Personal Protective Equipment

Site policy regarding the use of PPE is established in procedures. A variety of personal protective equipment is made available including gloves, boots, safety glasses, hearing protection, and respirators. Where PPE is needed requirements for its use are integrated into JHAs.

Few staff requires respiratory protection, but there is a strong program for medical evaluation, respirator fit testing, and training for respirator users.

D. Preventive Maintenance

ORISE has implemented a comprehensive Preventive Maintenance (PM) program developed with involvement of the maintenance mechanics. The involvement of maintenance mechanics in the development and continuous improvement of the PM program is noteworthy. PMs are used to mitigate the chances and effects of unplanned equipment failure, thereby enhancing safe and effective operations. PM schedules are based on manufacturer's recommendations and operating experience.

E. Emergency Preparedness

ORISE has a strong emergency preparedness program. While there are few postulated incidents from ORISE activities that could create an emergency that would extend beyond the immediate area of the event, natural events such as severe weather are not uncommon in Oak Ridge and the ORISE emergency preparedness program fully addresses such events. ORISE has fire protection systems and regular staff training and drills that enable prompt and efficient evacuation of facilities in the event of a fire.

F. Radiation Protection Program

While there is relatively little radioactive material at ORISE compared to some contractors, tritium containing materials, and sealed sources, and other relatively small amounts of radioactive materials are used to support training, analysis, and research activities. ORISE has well trained radiological control support staff and well trained and qualified radiation workers. The radiological safety officer is a CHP who is supported by a National Registry of Radiation Protection Technologists (NRRPT) certified radiation protection technician. They work together to ensure that radiation hazards are controlled. The ORISE radiological protection program complies with 10 CFR 835 requirements and its implementation is overviewed by the DOE Oak Ridge Operations Radiation Protection Program Manager.

Many ORISE staff are highly qualified in the radiological field, with some carrying CHP and NRRPT certifications. Radiological workers are trained to perform their own surveys and their activities are closely overviewed by the radiological control staff.

G. Medical Programs

ORISE has a strong medical program founded on a highly qualified occupational health nurse and a process of medical evaluation for all employees. The PRWC form is completed for each employee and it is reviewed annually and updated as needed. The nurse works with the manager of each employee to verify worker medical evaluation needs and the nurse's office arranges for appropriate medical evaluation by an occupational physician service that is retained under contract. The nurse proactively provides a wide variety of services to ORISE staff members and makes herself available for emergency and non-emergency response to any health-related condition. Physicians and nurses from REAC/TS are available to support the ORISE medical program.

H. Occupational Safety and Health Programs

ORISE policies and procedures are based on appropriate DOE contract clauses, orders, Contract Requirement Documents, and industry standards. ORISE-wide procedures are written and maintained by the ES&H organization to address worker health and safety requirements. Organizational ISM plans reference applicable procedures and other documents to provide a clear and integrated communication of occupational safety and health programs for managers and staff members. The hazards and hazard mitigation for specific activities are addressed by Job Hazard Analyses or other documents such as Health and Safety Plans. The procedures, JHAs, and other documents appropriately translate requirements and best practices into working level guidance. Lessons learned are incorporated into program documentation as appropriate.

VII. Safety and Health Training

The safety & health training processes used by ORISE are structured and implemented according to ISM core functions and guiding principles; these processes adequately train workers, supervisors and managers in recognizing hazards and performing their work safely. Employees, who were interviewed during this review, as well as observations made by the Team, confirmed that these processes are used and understood by ORISE employees throughout the organization. The onsite review clearly showed that ORISE has the processes effectively developed, communicated, implemented, and self-assessed to meet not only the tenet of safety & health training, but also each of the three (3) elements of safety & health training. These processes have been in place for at least three (3) years. Description of the processes and activities at ORISE for safety & health training are described below.

Processes are in place that formally define the training required, and assure completion, for employees, supervisors, and manager/directors. The Team confirmed – through interviews, observations, and document reviews – that each ORISE employee receives training commensurate with their job description, responsibilities, and authority. Additionally, the Team noted that employees in the maintenance department have been trained as “competent persons” in a variety of areas (e.g. scaffold erection and excavation). Methods used to train employees in hazard recognition begin with the General Employee Safety Training at hire, and continue with updates on selected topics at least annually for all employees.

Most training at ORISE is computer-based. Interviews with employees demonstrated that the training is comprehensive, user-friendly, and is appropriately developed for the audience. In short – to a person – ORISE employees appreciate the type and method for training; a noteworthy situation!

All training provided has a “knowledge check” (test) associated with the course – a feedback loop in the “knowledge check” for incorrect responses reinforces learning.

ORISE conducts a wide variety of training for others – both onsite and offsite. Training plans and course syllabuses (which include a hazard analysis where the training includes a “hands-on” component) are formally developed, and are comprehensive in nature.

As a result of the self-assessment conducted in 2003, ORISE developed and completed an upgraded course on safety – with several modules – for supervisor/managers (a Team member attended the training, and was favorably impressed).

ORISE recognizes that not all of their training/tracking systems are fully integrated. ORISE training department has developed an improvement action to correct this condition.

Appendix

DOE-VPP Review Team Assignments

Oak Ridge Institute for Science and Education

Oak Ridge, TN

December 15-18, 2003

Name	Organization	Areas of Responsibility
Rama Sastry Rama.Sastry@eh.doe.gov	Team Leader EH-31, DOE-HQ	Management Leadership Safety & Health Training
Dan Palmer Daniel_S_Palmer@RL.gov	Fluor Federal Services, Richland, WA	Work Site Analysis Safety & Health Training
Pranab Guha Pranab.Guha@hq.doe.gov	EH-31, DOE-HQ	Hazard Prevention and Control Management Leadership
Pat Wright Pat.wright@pnl.gov	PNNL, Richland, WA	Employee Involvement Hazard Prevention & Control
Jenny Mullins MullinsJG@oro.doe.gov	DOE-ORO	Work Site Analysis Employee Involvement

